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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,749	08/19/2003	Kinji Kayanuma	017344-0326	8178

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FOLEY AND LARDNER LLP
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EXAMINER

TRAN, KHANH C

ART UNIT	PAPER NUMBER
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2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No. 10/642,749	Applicant(s) KAYANUMA, KINJI	
	Examiner Khanh Tran	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-22 and 24-44 is/are allowed.
- 6) ☒ Claim(s) 1 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Preliminary Amendment filed on 09/23/2004 has been entered. Claims 1-44 are pending in this Office action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calderbank et al. U.S. Patent 5,960,041.

Regarding claim 1, in column 1 line 60 via column 2 line 67, Calderbank et al. discusses prior art in which modulation coding may be implemented, for example, by dividing digital information that is to be recorded into sets of bits, called information words. Each information word is then used to select a codeword in a codebook. The codewords in the codebook are of length N bits where the codeword bits define a channel sequence, in other words, a sequence of symbols to be sent over a channel. As known in the art, the code word has greater length than information word due to bit redundancy for error detection and error correction.

The prior art does not explicitly disclose the step of "detecting a bit sequence of a predetermined pattern in the stored channel bit stream".

As further disclosed that it is often desirable to use channel sequences that have a spectral null at zero (dc) frequency by which it is meant that the power spectral density function of the channel sequence at dc equals zero. Such sequences are said to be dc-free. One way to assure a dc-free sequence is to design a system in which the block digital sum, or the arithmetic sum, of symbols in a codeword transmitted over a channel is zero. In view of the foregoing disclosure, one of ordinary skill in the art at the time the invention was made would have recognized that the codewords in a codebook can be designed (predetermined sequences) so that the code words include dc-free codewords. The Block Digital Sum (BDS) is defined as shown in prior art to be equal to zero; column 2 lines 55-62.

Codewords of bipolar symbols, for example, +1 and -1, and having a BDS equal to zero, are possible only if the codeword length N is even and if half the symbols are -1 and half the symbols are +1. Hence, in the case of the detecting bits are 00001000, one of ordinary skill in the art would have recognized that the bit "1" digit needs to be replaced with a bit "0" in order for the sequence to be dc-free.

Regarding claim 23, claim is rejected on the same ground as for claim 1 because of similar scope. As disclosed in column 2 lines 35-67, the codebook (look-up table) is stored in a buffer. The means maps information words to codewords. And a means performs a calculation of BDS.

Allowable Subject Matter

3. Claims 2-22 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 2-22 are allowed over prior art of record because the cited reference cannot teach or suggest a data modulation method as set forth in the application claim.

4. Claims 24-44 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 24-44 are allowed over prior art of record because the cited reference cannot teach or suggest a data modulation apparatus as set forth in the application claim.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Soljanin U.S. Patent 5,608,397 discloses "Method And Apparatus For Generating DC-Free Sequences".

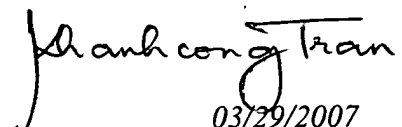
Roth U.S. Patent 6,002,718 discloses "Method And Apparatus For Generating DC-Free Sequences".

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KCT


03/29/2007
Khanh Tran
Primary Examiner